Midwest ISO Markets

"*Tackling Challenges & Forging Ahead*"

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Why markets?
Why a Midwest ISO
administered market?

- *Create a framework for robust, transparent and competitive electric markets.*
  - *Markets work better when there are many buyers and sellers*
  - *Competition yields lower prices*
  - *Sellers will build if there's an opportunity to earn a return commensurate with the risks.*
- *Competitive markets are efficient!*
  - *Maximizing consumer welfare*
  - *'Correct' allocation of scarce resources*
  - *Production at lowest cost*
- *Enhance system reliability*

Real-Time Centralized Dispatch

- MISO uses the Security Constrained Economic Dispatch (SCED) program every 5 minutes of each operating hour
- MISO sends control areas Net Scheduled Interchange (NSI) and basepoints for generators
  - NSI and resource basepoints sent every 5 minutes
  - Dynamic Schedules sent every 5 minutes
  - Ramped Balancing Area NSI sent every 4 seconds
  - Ramped Dynamic Schedule values sent every 4 seconds

- Balancing Areas are responsible for regulation between dispatch interval and for operating reserves
- MISO calculates ex-post Real-Time LMPs based on actual system activity

Other Market Design Elements

The Real Time market operator and the market participants want some certainty that enough resources are available every five minutes to meet the load demands, or to keep the lights on.

Midwest ISO Energy Markets

- The critical design elements included in these Markets are:
  - **Real-Time Centralized Dispatch**
  - **Integrated Energy and Congestion Management Day-Ahead Market**
  - **Locational Marginal Pricing (LMP)**
  - **Financial Transmission Rights**
  - **Reliability Assessment Commitment (RAC)**
  - **Self-Schedules and Bilateral Schedules**
  - **Use Limited and Demand Response Resources**
  - **Accommodate Retail Access Programs**
  - **Load Aggregation and Trading Hubs**
  - **Market Timeline**
  - **Market Power Mitigation**

  - **Security Constrained Unit Commitment (SCUC)**
  - **Resource Adequacy**
  - **Pre-OATT Contracts (grand fathered agreements)**
  - **Ancillary Service Procurement**
  - **Control Area Activities**
  - **Market Settlements**

Day 2 Market Issues

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The Reliability Charter

Midwest ISO & Balancing Area roles and responsibilities: Real-Time Energy Market

- Multi-Balancing Area Implementation
- The Midwest ISO will not directly control generation
- 5-minute LMP Base-points produced by the Midwest ISO and sent to Market Participants using 5-minute Load Forecast at Balancing Area granularity
- Net Scheduled Interchange calculated by the Midwest ISO and sent to each Balancing Area continuously
- Balancing Area performs regulation between 5 minute LMP base-points
- Generation limits sent by market participants has generation set aside for regulation and operating reserves “blocked off” from LMP dispatch

Day 2 Market Issues

Renewables & Interconnection

Renewables & Interconnection

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Renewables –
market impacts

Renewables –
market impacts

Renewables –
market impacts

Demand Response Resources

Resource attribute tracking

Resource Adequacy: planning & operating reserves
The following principles have guided development of the Midwest ISO's resource adequacy proposal:

- The resource adequacy proposal should enhance system reliability and security;
- The resource adequacy proposal should not impose any additional costs for the Midwest ISO's market participants without a commensurate increase in system reliability;
- The resource adequacy proposal should not promote the abuse of market power.

Resource Adequacy: planning & operating reserves

Interim Approach:
- Comply with existing RRO or state reliability requirements
- Standard setting responsibility
- Midwest ISO Designated Network Resources (DNRs)
- Must Offer requirements
- Midwest ISO role in RRO process

- Midwest ISO supply adequacy working group (SAWG)
- Organization of Midwest ISO States (OMS) resource adequacy working group
- OMS/SAWG principles & work plan

- **Expectation: MISO filing on permanent resource adequacy: mid-2005**

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Ancillary Services at Energy Market Implementation

Operating reserve obligations met primarily through existing RRO reserve sharing groups
- Transmission customers continue to have option to purchase Schedules 5 & 6 from the Midwest ISO or may self-supply
- Reserve deployment treated as bilateral transactions outside of LMP settlement for predefined period following generation contingency
- Real-time LMPs reflect impact of lost resource following reserve deployment period

Ancillary Services at Energy Market Implementation

- NERC/RRO Reliability Standard compliance remains responsibility of Control

Areas, not the Midwest ISO. Need to define role of the Midwest ISO as agent in operating reserve deployment

- Existing Reserve Sharing Groups include non-Midwest ISO participants. Need to accommodate reserve sharing spanning RTO boundaries
- Release of operating reserves during energy emergencies (LMP impacts)

Benefits for participants

- Reduced barriers to trade
  - Elimination of pancaked transmission rates
  - Uniform access -- one stop shopping for transmission service and interconnection
  - TLR replaced with market-based redispatch
- Coordinated markets
  - Liquidity/transparency
  - Expanded choices
    - Self-scheduled generation or load
    - Bilateral transactions
    - Spot purchases or sales
    - Forward hedging
    - Virtual transactions

Questions/comments?

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For more information

- **www.midwestiso.org**